

**Climate Change Action Plan
Agriculture, Forestry and Waste (AFW) - Draft Action Report List and Summaries**

**New Hampshire Climate Change Policy Task Force
Draft Action Report List and Summaries**

**Agriculture Forestry and Waste
Working Group**

**Prepared by NHDES
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Agriculture, Forestry and Waste Action Report List

AFW Goal 1 - Carbon Sequestration

AFW Action 1.1 Build Up Soil Carbon

AFW Action 1.1.1 Increase Cover Crops

AFW Action 1.1.2 Increase Conservation Tillage/No-Till Farming Practices

AFW Action 1.1.3 Agriculture Land Protection

AFW Action 1.2 Avoid Forest Land Conversion

AFW Action 1.3 Durable Wood Product Promotion

AFW Goal 2 - Fuel and Electricity Generation

AFW Action 2.1 Encourage the Construction and Use of Bioreactors

AFW Action 2.2 Maximize Availability of Biomass for Electricity and Heating within Sustainable Limits

AFW Action 2.2.1 Maintain Infrastructure to Support Biomass Production and Support Regulatory and Business Efficiencies

AFW Action 2.2.2 Ensure Biomass Consumption is within Sustainable Limits

AFW Action 2.2.3 Ensure the Most Efficient Use of Energy/Biomass Stock

AFW Action 2.3 Secondary Biodiesel Feedstocks

AFW Action 2.4 Encourage the Use of Biogenic Waste Sources for Energy Generation

AFW - Goal 3: Recycling and Source Reduction

AFW Action 3.1 Pay-As-You-Throw Initiative (PAYT)

AFW – Goal 4: Reduced Food System Emissions

AFW Action 4.1 Strengthen Local Food Systems

AFW Action 1.1.1 - Increase Cover Crops

Summary Cover crops should be promoted in agricultural activities. Soil carbon content and the capacity of soil to hold nitrogen can be increased by cultivating cover crops. Increasing the use of cover crops can also potentially increase the nitrogen content of soil and reduce the amount of fertilizer needed.

AFW Action 1.1.2 - Increase Conservation Tillage/No-Till Farming Practices

Summary: There should be wider adoption of agricultural practices that reduce soil disruption and that can increase soil organic content through carbon deposition. These practices can increase the total carbon content (stock) of soil and reduce the rate of carbon loss (flow) to the atmosphere through decomposition.

AFW Action 1.1.3 - Agriculture Land Protection

Summary: There should be a greater emphasis on preserving existing agricultural land. The conversion of agricultural land to developed land affects its carbon absorption capacity. Acquiring and preserving open space, reducing sprawl through smart growth measures and encouraging the reuse of existing infrastructure can avoid releases of carbon stored in soils preserves the carbon absorption capacity of existing agricultural lands and enables continued carbon sequestration from the atmosphere.

AFW Action 1.2 Avoid Forest Land Conversion

Summary: It is critical that we sustain this natural carbon sink and its capacity to take man made CO₂ out of the atmosphere. Through photosynthesis, New Hampshire's forests take up 25 percent of the State's manmade CO₂ emissions annually (by EPA's estimate). Minimizing forest land conversion to non-forested uses is a key goal to any successful emission reduction strategy as it sustains the sink and avoids new CO₂ emissions (20% of global manmade emissions of CO₂ are the result of conversion of forest land to non forested uses). Encouraging forest land owners to manage their land sustainably for forest products and to also manage their forest land to store additional carbon should be the focus of public policy objectives. More conservation of large blocks of unfragmented forest land through perpetual easements, an activity with which New Hampshire has had great success, continues to be a key tool in sustaining the carbon sink New Hampshire's forests presently provide.

AFW Action 1.3 - Durable Wood Product Promotion

Summary: There should be a program developed to develop a market for durable wood products. When wood is used to produce products that are valued and held for long periods of time, carbon is stored and not released to the atmosphere. Consumers often have a choice between products made from petroleum or a mineral base versus those produced from wood. The purchase decision is often based on price and a short term, "throw away" mentality. An education campaign could change consumer thinking to use of durable wood products over other materials when buying furniture, building homes, and other structures. Using durable wood

products can be more economical while providing a benefit to the environment. This program provides additional benefits to the economy of New Hampshire while improving product, and transportation efficiency.

AFW Action 2.1 - Encourage the Construction and Use of Bioreactors

Summary: Bioreactors should be promoted as an alternative to conventional landfills in order to speed up the decomposition of solid waste better enable the recovery of landfill natural gas (LNG) or methane as an alternative fuel to produce energy. While more LNG can be generated and captured at conventional landfills, the entire process can be enhanced by using bioreactors. This technology is already being used at the state's largest landfill owned by Waste Management, Inc. to supply electricity to the University of New Hampshire in Durham. The State can seek to increase the number of landfills in New Hampshire that reduce methane and generate electricity by: encouraging the generation of additional electricity from landfill gas-to-energy (LFGE) projects in the state through the New Hampshire renewable portfolio standard; working with the PUC and NHDES to streamline project permitting; and supporting the interconnection of these projects by working with the PUC to determine whether projects are viable.

AFW Action 2.2.1 - Maintain Infrastructure to Support Biomass Production Support Regulatory and Business Efficiencies

Summary: The State of New Hampshire must continue to maintain this infrastructure through policies which aid or do not impede the ability to conduct forestry based business in New Hampshire. The State of New Hampshire's forest industry has long been one of the cornerstones of New Hampshire's economic health. Historically, pulp mills, sawmills, and the production of firewood for home heating have provided the logging industry in this state with diverse markets within which to market their wood. However, New Hampshire has recently seen the loss of pulp and paper production in Berlin and Groveton, as well as a reduction in saw mill capacity for both hardwood and softwood mills. Relatively new markets, such as the production of electricity from wood chips (biomass) and the production of wood pellets for heating residential and public buildings, have provided needed markets for low grade wood and have helped to strengthen existing logging infrastructure. These markets also reduce the use of fossil fuels, thus reducing the state's dependence on foreign sources of energy, as well as reducing its carbon foot print.

AFW Action 2.2.2 - Ensure Biomass Consumption is within Sustainable Limits

Summary: New Hampshire's forested lands should be managed to sustainably provide forest products and energy sources over the longterm. Forest biomass represents significant new opportunity to meet demands for both thermal and electric energy. However, biomass stocks to support this demand are not unlimited and biomass is only one of a suite of benefits we realize from our forests. Biomass consumption needs to be within the biological capacity of the land to grow fiber, should not compromise biological diversity, water quality, recreational values and aesthetics and should compliment the existing forest products economy.

AFW Action 2.2.3 Ensure the Most Efficient Use of Energy/Biomass Stock and Promote Co-Location Projects

Summary: Plans should be carefully made to locate facilities that utilize biomass in order to make the most efficient use of the resource and reduce overall energy use and greenhouse gas emissions. The economics and supply of wood biomass for energy or thermal heat production is complex and has many important variables. Planners, producers, potential suppliers, marketers, investors, governments, regulators and consumers need some understanding of these factors and the underlying resource data to make good decisions about the efficient use of the available resource. Low grade wood material appropriate for power generation or thermal heat production is limited in availability and its value is quickly diminished by the cost or distance it must be transported. It will be very important to carefully plan the location of the large consumers of this material to preserve the efficiency of the industry.

AFW Action 2.3 - Increase Development and Use of Secondary Feedstocks for Biodiesel (Under Development)

Summary: The State should promote the research and development (R&D) and commercialization of biodiesel production in-state that relies on alternative, sustainable feedstocks such as yellow and brown grease and oil derived from algae. The soy industry has been the driving force behind biodiesel commercialization because of product surpluses in the Midwest states and declining prices. Although a large portion of U.S. soybean oil is currently used for food purposes, the 20.4 billion pounds of oil cultivated in 2007 could have produced 2.65 billion gallons of biodiesel. In comparison to the U.S. demand for distillate fuel of 62 billion gallons in 2006, utilization of all soy oil for fuel would only amount to 4.3% of the demand. Furthermore, production of biodiesel from virgin vegetable oils like soy will have a great impact on global foodmarkets. Conversely, biodiesel produced from alternative sources may allow a greater portion of the fossil fuels used for transportation and heating fuels to be replaced by renewable sources without influencing food costs or supply.

AFW Action 2.4 - Encourage the Use of Biogenic Waste Sources for Energy Generation (Under Development)

Summary: The State should create and implement innovative programs to encourage the development of facilities and processes that utilize biogenic waste streams as energy sources and reduce New Hampshire's reliance on fossil fuels. These wastes can be generated in municipal, residential, agricultural, institutional and industrial settings and can provide heat, power and fuel through a number of applications. The potential wastes include sludge, septage, municipal and industrial wastewater, brown grease, residential and institutional food waste, and manure.

Due to the impact that a variety of factors can have on determining the most economical and efficient use of waste streams for energy, the state should create a flexible program that will enable the most appropriate application to be selected and developed. These projects could be incentivized through the creation of a loan program to assist livestock and industrial operations and the modification of existing funding mechanisms for municipal facilities to address the issue of higher first/capital costs and realize the long-term reduction in operating costs and fossil fuel

consumption. Additional resources could be developed to facilitate the optimization of the selected processes and achieve peak efficiencies.

AFW Action 3.1 - Pay-As-You-Throw Initiative (PAYT)

Summary: Pay-As-You-Throw (PAYT) programs should be promoted for municipalities as a means to address waste generation and increased recycling. A significant portion of the solid waste stream is composed of materials with a significant embodied energy and many materials have the potential to be recycled or reused and displace the emissions associated with producing new materials from virgin raw materials. The recycling rate in New Hampshire is less than 21%, well below the national rate of 32%. There are a number of potential strategies to see this rate increase, but one that has already proven successful in a number of New Hampshire communities is PAYT, a system that requires households to pay for waste disposal based on the amount they generate. The fee that is assessed for each bag or can of waste or based on the weight of the trash provides an incentive for households to generate less waste, and to reuse, compost and recycle what remains.

AFW Action 4.1 - Strengthen Local Food Systems

Summary: Stronger local food networks should be promoted and developed with the state. Food processing, packaging, storage, refrigeration, transportation, and marketing consume the vast majority of the energy used in the food industry. Food transported from the larger food producing centers can travel more than 20 times the distance of locally grown produce. Development of a stronger local food network can reduce the carbon emissions associated with distant food production, and may also insulate the state from disruptions in the food supply in the event that energy supply or transportation is threatened. This would be accomplished by raising public awareness of the benefits and availability of locally grown and produced foods as well as developing and supporting marketing channels and programs, which can be similar to the *Fair Trade* concept, that can harvest the needed price premiums from local and regional markets for local and regional producers.